

**To:** Chapin, Thomas[tchapin@usgs.gov]  
**From:** Wall, Dan  
**Sent:** Sun 8/9/2015 2:27:36 PM  
**Subject:** RE: Benthic Invertebrate Analysis

I am fine with whatever you think is best Thomas. Submersible is probably better IMHO.

I am concerned that the sippers placed near the intake will give the impression that the results can be used for assessing the potential effects on the water source and because they are dissolved results we should call these results Santa Rita Park instead of Durango Water intake. Location will be approximately the same. Wells/Ex. 9

**From:** Chapin, Thomas [mailto:tchapin@usgs.gov]  
**Sent:** Saturday, August 08, 2015 10:12 PM  
**To:** Wall, Dan  
**Subject:** Re: Benthic Invertebrate Analysis

Hi Dan,

4 mL samples is fine at the locations you listed. I'll be in my lab tomorrow and will look for the SOP we have, or the one I use with Robyn and Jean.

Do have a question about the out of water minisippers. The ones that I am preparing are all the submersible versions that we used on the Animas. I can use these sippers out of water on the streambank with a longer intake. Freezing conditions in Silverton aren't really a concern right now and even if it does freeze, it won't damage anything, just won't pump. I do think this will increase the reliability of the deployments so I propose that I set all the installations up as out of water installations. I can rock them over on the stream bank for concealment, but a pile of rocks does attract attention.

This would also make it easier to have them shipped back to me in Denver for faster sample turn-around.

If you think that vandalism is a big concern, then I can submerge them. No need for an immediate decision, I can make the changes in the field.

Also can you send me co-ordinates for the Gold King site and the Durango intake site, I know where the other sites are. Is there someone I need to talk to regarding access to the Durango water intake site?

On Sat, Aug 8, 2015 at 8:25 PM, Wall, Dan <[wall.dan@epa.gov](mailto:wall.dan@epa.gov)> wrote:

Craig and Peter, here are additions to the FSP that I recommend we implement.

We are analyzing samples from Mountain Studies Institute: The details are

1) The sediment plume arrived in Durango at Rotary Park at approximately 10:30 PM on Thursday, August 6. River water samples were collected at 8 PM, 9 PM, 10 PM, 10:30 PM, 11 PM, 11:30 PM, 12:00 AM, and 12:30 AM. And will be analyzed for total recoverable metals at Green Analytical (see attached COC). Marcie will need to see the SOP and let us know if it covers their sampling method. Samples were not preserved in the field before delivering to the lab but that is acceptable under the analytical SOP as I understand it.

2) Following the collection of the grab samples above, an Isco sampler was deployed at Rotary Park to collect grab samples every 6 hours. Samples to be analyzed will be determined based on the visual condition of the river and precipitation events.

3) Please Include the collection and analysis of benthic invertebrates. We collected quantitative benthic macroinvertebrate samples from Rotary Park and 32nd Street prior to the arrival of the sediment plume. We will re-sample these two sites in the coming days to document any changes to benthic macroinvertebrate community composition that may occur as a result of the event. The method, which I hope will suffice for an SOP is in the email string below. Please include sediment samples from these locations as well. I believe we will have a total of 10 locations

sampled 2 times.? Scott, can you please tell us which locations you will be sampling and when or any other additions.?

We are also collecting samples via USGS

1) We (USGS) will deploy minisipper samplers (if possible) at the Gold King Adit, A68, A72, Bakers Bridge, and 2 mini-sipper samplers at the Durango water intake. The samplers will be programmed to collect 4 ml samples every 2 hours for approximately 25 days. How the samples will be analyzed and potentially composited will be based on precipitation events and responsiveness to changing conditions. I am hoping the attached publication will suffice for an SOP. Please include grab samples at these locations on a weekly basis(total and dissolved) Thomas do you have any input?

Please let me know if you have any questions or concerns. I will be in at 7.

**From:** Kastner (Dinneen), Ellie [mailto:[Ellie.Kastner@WestonSolutions.com](mailto:Ellie.Kastner@WestonSolutions.com)]  
**Sent:** Saturday, August 08, 2015 7:01 PM  
**To:** Wall, Dan  
**Cc:** Myers, Craig; Stevenson, Peter; Robinson, David; Blanchard, Mark R.  
**Subject:** Re: Benthic Invertebrate Analysis

Dan,

We're working on the QAPP now. You can send me any additions that you would like to see in the QAPP.

I can send you the reference for the surface water sampling SOP.

Ellie Kastner

Weston Solutions

(via mobile device)

On Aug 8, 2015, at 5:19 PM, Wall, Dan <[wall.dan@epa.gov](mailto:wall.dan@epa.gov)> wrote:

Ellie, I am trying to get a copy of the surface water sampling SOP from you for review by the mountain studies institute to determine if or how their sample collection deviated from what will be in the FSP. I have several other additions that need to get into the FSP to make sure some of the entities helping us collect data are covered under our FSP. Who can help me with this?

**From:** Kastner (Dinneen), Ellie [<mailto:Ellie.Kastner@WestonSolutions.com>]

**Sent:** Saturday, August 08, 2015 4:46 PM

**To:** Wall, Dan; Myers, Craig

**Cc:** Robinson, David

**Subject:** RE: Benthic Invertebrate Analysis

Great! Thanks!!

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Ellie Kastner  
Weston Solutions, Inc.  
Associate Project Engineer  
303-729-6158

**From:** Wall, Dan [<mailto:wall.dan@epa.gov>]

**Sent:** Saturday, August 08, 2015 4:30 PM

**To:** Kastner (Dinneen), Ellie; Myers, Craig

**Cc:** Robinson, David

**Subject:** RE: Benthic Invertebrate Analysis

Please see below

Here is the “SOP”

#### BMI Methodology:

In order to allow direct comparison to the historical Animas River BMI dataset, we replicated a BMI sampling method (to the greatest extent possible) that was developed by Chester Anderson and used previously on the Animas River (Anderson 2007; personal communication). Anderson’s method utilizes and modifies protocols developed by the Environmental Protection Agency (Barbour et al. 1999) and Colorado Department of Public Health and Environment (CDPHE 2010).

Anderson (2007) assessed a variety of BMI sampling methods and determined that the most appropriate method for use in the Animas River was a targeted riffle method that utilizes a modified rectangular dip net coupled with a dolphin bucket. The size of the net opening is 46 cm by 25 cm or 0.115 m<sup>2</sup> (178 in<sup>2</sup>). We implemented this methodology using the same rectangular dip net used in Anderson’s previous Animas River BMI sampling. Each sample was collected by placing the net securely on the bottom of the river with the net opening facing upstream. A biologist stood downstream of the net and disturbed the substrate on the river bottom that was immediately upstream of the net. Substrate was disturbed by lifting and scrubbing rocks and gravel by hand for approximately 90 seconds so that benthic macroinvertebrates would be dislodged and drift downstream into the net opening. For each sample, an area of approximately 0.115 m<sup>2</sup> of substrate was disturbed, which is identical to the size of the net opening. For each site, five samples were obtained diagonally across riffle habitat within an approximately 100 meter-long section of the river. The five samples were then composited into a single sample container. Thus, 0.575 m<sup>2</sup> (890 in<sup>2</sup>) of riffle habitat was sampled at each site (0.115m<sup>2</sup> x 5 samples).

#### Works Cited:

Anderson, C. 2007. Effects of Mining on Benthic Macroinvertebrate Communities and Monitoring Strategy. *In* S. Church, P. von Guerard, and S. Finger (Eds.), Integrated Investigations of Environmental Effects of Historical Mining in the Animas River Watershed, San Juan County, Colorado. USGS Professional Paper 1651.

Anderson, C. 2013. Personal Communication, 10/8/2013.

Barbour, M., J. Gerritsen, B. Snyder, and J. Stribling. 1999. Rapid Bioassessment

Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic

Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. US Environmental Protection Agency; Office of Water; Washington, D.C.

Colorado Department of Public Health and Environment. 2010. Benthic

Macroinvertebrate Sampling Protocols. Water Quality Control Division –

Standard Operation Procedure. WQCDSOP-001.

**From:** Kastner (Dinneen), Ellie [<mailto:Ellie.Kastner@WestonSolutions.com>]

**Sent:** Saturday, August 08, 2015 3:10 PM

**To:** Wall, Dan; Myers, Craig

**Cc:** Robinson, David

**Subject:** Benthic Invertebrate Analysis

Hi Craig and Dan,

I spoke with Stave Auer (TechLaw) regarding the analysis that you would like to have performed. Steve mentioned that lab procurement may not be able to begin until Monday since the lab isn't available at this time on Saturday. After speaking with him, I have several questions for you, below.

The information I had about the samples was (to ensure correctness):

- Ten sediment samples I would recommend that but we need to make sure we aren't redundant with the overall sediment plan and I will need Craigs concurrence.

- Desire benthic invertebrate analysis

My questions for you after speaking with Steve:

- Do you want identification alone or would you like the full multi-metrics index that indicates how polluted the aquatic environment is? Full MMI
- What are your expectations as far as turnaround time? Steve says that a two week TAT may be possible and that would be the fastest end of the spectrum. 2 week, depending on cost
- Are the samples in your custody? No. Some samples have been collected and some are currently being collected. I expect them ready to ship today.

My goals:

- Get lab shipping information for you
- Get analysis cost information for you On a per sample basis please.

Please let me know what else you need or what else I can do to support you. Thank you and have a great day!!

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Ellie Kastner  
Weston Solutions, Inc.  
Associate Project Engineer  
303-729-6158

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Thanks,

Thomas

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